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AN EXTENSIVE FOREST DISEASE SURVEY
OF SECOND-GROWTH STANDS IN SOUTHEAST ALASKA

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Some previous surveys have been made of forest diseases in Alaska (Baxter (1), Kimmey (2), Laurent (3)) but nearly all information on disease occurrence has been secured from mature stands. The rate of cutting in old-growth stands has accelerated at a rapid pace during the past two decades which resulted in a similar increase in the area of second-growth stands. Since the acreage of second-growth stands is increasing yearly, Region 10 thought it advisable to examine some of these younger stands to determine what diseases, if any, were present; and for those diseases found, secure information on their extent and intensity.

An extensive type forest disease survey of second-growth timber stands on the North and South Tongass National Forests of R-10 was made by Don Curtis of R-10, Tom Laurent of INF, and Douglas Miller, Consultant, R-5 during the period of June 1-10, 1971. (R-10 reference 6130, 2/16/71 to R-6)

All second-growth stands examined supported a mixture of Sitka spruce and western hemlock while some stands supported varying amounts of western red cedar and/or yellow cedar. The young stands examined varied in size from about 40 acres to over 1,000 acres. Most stands followed clearcutting of the original stands but one each resulted from blowdown and fire. Some alder, cottonwood, willow, etc., were frequently present somewhere within each stand examined.

The majority of the stands were even-aged but a few had some residual trees standing. The residual trees were frequently defective and in the case of hemlock were often infected with dwarf mistletoe. These residual trees provided inoculum of many diseases and were especially hazardous to the young timber growing in the vicinity.

The second-growth stands examined ranged in age from trees six years old to trees about 100 years old. All stands examined were fully stocked. Reproduction following harvesting seems to be no problem in Southeast Alaska. In fact, most young stands were overstocked but competition for space, light, and moisture soon reduces the number of trees to that which the site can support. No stagnated stand was observed while making the survey.

DISEASES FOUND

DWARF MISTLETOE. The second-growth stands examined were found to be generally in good health. Probably the most serious pest at the time of the survey was dwarf mistletoe (Arceuthobium tsugensis) in western hemlock.

Of the 23 areas examined, 10 supported dwarf mistletoe either in the young stand or in the old-growth hemlock at the edge of the cut block between the two age groups.

The only second-growth stands where dwarf mistletoe was a serious problem were those where residual trees infected with the parasite had been left at the time of logging. Since the infected trees in these stands were in the smaller size classes, the dwarf mistletoe could be controlled by removing the residuals and through thinning by removing the infection from the understory.

It appears that in the Tongass National Forests clearcutting will keep dwarf mistletoe in hemlock to the role of a minor pest.

An observation of interest was the finding of three Sitka spruce trees growing in a heavily infected stand of hemlock near Kake infected with the hemlock dwarf mistletoe. Although Laurent (4) had found and reported this situation elsewhere, it is still rare enough to be worthy of mention.

SIROCOCCUS STROBILINUS*. A tip and leader dieback caused by the fungus Sirococcus strobilinus was causing some damage at both Edna Bay and Thomas Bay in young hemlock from 3 to 30 feet high. Symptoms in young trees elsewhere, particularly at the Pot Holes area, indicated the disease may be more widespread than now known. The disease has been watched by both the Forest personnel and members of R-10 and INF for two or three years and to them it appears to be spreading.

The first symptom is that the needles of the leader begin to fade and drop. The leader then begins to shrivel and soon dies, but the fungus continues to work its way down into the two-year-old stem. When the tips of several side branches are affected, the tree's growth is reduced and the tree becomes vulnerable to attack by insects or other fungi. Some small trees appeared to have been killed by the disease alone.

Thousands of trees were infected at both Edna Bay and Thomas Bay and damage from the disease could have been serious had not the stands been heavily overstocked. The disease should be closely watched as little is known about its potentialities as a killer. Permanent plots should be established to study its behavior because it has the potential of becoming a serious threat to the young hemlock stands in Southeast Alaska.

*Little is known about this fungus especially about its pathogenicity. A similar fungus thought to be the same species, has been known in Europe for some time but its appearance in western North America may be of recent occurrence. Dr. Arnold Funk of the Canadian Forest Service, Victoria, B.C. in a letter dated May 27, 1971 to Donald J. Curtis stated in part: "It now appears that the fungus causing dieback in your advanced hemlock regeneration in the Petersburg area may be correctly referred to as Sirococcus strobilinus (this is the accepted name of Ascochyta parasitica, to which I referred in an earlier letter December 18, 1969)."

ROOT DISEASES. Two root diseases Armillaria mellea and Fomes annosus were found. A. mellea was frequently seen on the roots of windthrown trees; but since the stands were quite healthy, it appeared to be causing little, if any, damage. F. annosus was found in a stump and a nearby windthrown spruce tree at the Old Tenekee Cannery site. It appeared to be causing no damage.

FOLIAGE DISEASES. Four foliage diseases were observed. A needle cast caused by the fungus Lophodermium piceae was found on Sitka spruce needles at seven areas. Only one or two trees were seen that had even a moderate amount of infection. The total damage was nil. A rust caused by the fungus Chrysomyxa ledicola was also found on the needles of Sitka spruce at eight areas on the North Tongass National Forest. Its damage was negligible. A few needles on one lodgepole pine were found to be infected with a needle cast which appeared to be Davisomyces montana. One western red cedar appeared to be infected with Didymascella thujina.

WOOD ROTTING FUNGI. Sporophores of wood rotting fungi were common on the stumps, cull logs, and residual trees within young stands and on old-growth trees at the margin of the young-growth stands. Fomes pinicola was quite common on dead material and occasionally was found on one of the mature trees bordering the young stands. Fomes officinalis was found on an older tree at two of the areas. Fomes applanatus was found on down material at most areas. Fomes pini was found on hemlock at one area. Polyporus sulphureus was found at two areas while P. schweinitzii was also found in a couple of places. The latter fungus was in the vicinity of old stumps while the former was on snags.

Other fungi noted on down material were: Polyporus versicolor, P. abietinus, Lenzites saepiarum, Ganoderma oregonense, Poria sitchensis, and Stereum sanguinolentum. In addition to the above fungi, Hymenochaete tabacina was found on dead alder, Polyporus perennis was on pieces of wood in the duff, and Didymascella candida was common on dead stems of salmonberry.

Although many of the wood rotting fungi cause serious losses in old stands the young stands appeared to be free of damage. As the stands become older these fungi will enter the larger dead limbs, fallen tree scars or any other open wounds that may occur.

SUMMARY

The young second-growth stands examined in Southeast Alaska were generally well stocked and in good health. Dwarf mistletoe, a serious pest in many old-growth hemlock stands, is being fairly well controlled in the younger stands through clearcutting. Where no residual trees are left, the only source of infection is from the older stands adjacent to the younger stands. The possibility of dwarf mistletoe control should be explored in the few young stands where infected residuals are present.

Since little is known about the fungus Sirococcus strobilinus, the stands that are now infected with this disease should be watched carefully. Studies to learn more about S. strobilinus should be initiated immediately. Studies in control methods should also be initiated as this fungus could be a most serious threat to the hemlock of Southeast Alaska.

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